REMARKS

This Amendment is submitted in reply to the Final Office Action dated December 17, 2009. Applicant respectfully requests reconsideration and further examination of the patent application pursuant to 37 C.F.R. § 1.113.

Summary of the Examiner's objections and rejections

Claim 39 stands objected to because of an antecedent error.

Claims 33-34, 43-45, 52-54 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Jeffries (US 2004/0062259) in view of Bird (US 6,657,954).

Claims 35-42, 46-51, 55-64 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Jeffries (US 2004/0062259) in view of Bird (US 6,657,954), and further in view of Meyer et al (US 2002/0145976).

Summary of claim amendments

Applicant has canceled claims 36 and 56 (without prejudice), and amended claims 33, 37, 39, 53-55 and 57-64. The support for the amendments to independent claims 33 and 53 can be found on page 11, lines 7-10 and in canceled claims 36 and 56 of the originally filed patent application. The dependent claims 37, 54-55, and 57-64 where amended for antecedent purposes in view of the cancellation of claims 36 and 56 and the amendments to independent claims 33 and 53. No new subject matter has been added.

Remarks regarding objected claims

Claim 39 stands objected to because of an antecedent error. Applicant has amended claim 39 to depend from claim 37 rather than depend from claim 38 thus correcting the antecedent error. In addition, Applicant has amended claim 53 to delete the phrase "adapted to" as suggested by the Examiner. Accordingly, Applicant respectfully requests the removal of this objection.

Remarks regarding the §103(a) rejections

Applicant respectfully submits that the amended independent claim 33 is not disclosed or suggested by Jeffries, Bird, Meyer or any combination thereof. The amended independent claim 33 recites the following:

> 33. A method implemented by a network node for controlling a queue buffer, the queue buffer being connected to a link and being arranged to queue data units of a flow in a queue, comprising the steps of:
> determining a value of a length parameter related to the length of the queue;
> comparing the value with a length threshold value;
> performing a congestion notification procedure if the value is greater than the length threshold value, wherein the congestion notification procedure when performed drops or marks one or more data units;
> performing an automatic threshold adaptation procedure, wherein the automatic threshold adaptation procedure comprises a procedure for adjusting the length threshold value on the basis of one or more flow control parameters, wherein the automatic threshold adaptation procedure determines when the congestion notification procedure would be performed to drop or mark one or more of the data units; and
> determining, in a procedure, one or more of the one or more flow control parameters from a flow control parameter introduced by one of a sender and a receiver of the flow queued in the queue (emphasis added).

Note: The amended claim 33 recites the limitations in the previously presented claims 33 and 36. In addition, the preamble has been amended to indicate that a network node implements the method so as to clearly indicate there is a difference between the network node, the sender, and the receiver.

The Examiner indicated that the closest prior art Jeffries did not teach the claimed step of performing an automatic threshold adaptation procedure (see page 4 in the Final Office Action). In an attempt to correct Jeffries's deficiency, the Examiner cited Bird and stated "Bird et al. from the same or similar field of endeavor teach implementing fairness of the method, performing an automatic threshold adaptation procedure, wherein the automatic threshold adaptation procedure comprises a procedure for adjusting the length threshold value on a basis of one or more flow control parameters (column [6] lines 39-52), wherein the automatic threshold adaptation procedure determines when the congestion notification procedure would be performed

to drop one of the data units (column [7] lines 14-21)(see page 4 of the Final Office Action). The relevant sections of Bird are as follows:

> The techniques of the present invention monitor indicators of network conditions at a receiver component. When specific conditions are detected, the receiver adapts its threshold according to algorithms defined herein. As stated previously, a threshold is a value used by a receiver to determine whether the sender needs to increase or decrease the rate at which it puts data traffic into the network. The receiver compares an accumulated delay change sum (see FIG. 3) to the threshold value, and uses the result to respond to the sender's request for flow control feedback. Prior art receiver thresholds used static values. The dynamic threshold adaptation of the present invention enables the receiver to more accurately respond to the sender's requests for feedback. The sender can then use this more-accurate feedback to make adjustments to the transmission rate that result in more immediate reaction to network conditions than was possible with prior art techniques. The present invention applies to the monitoring of conditions, and threshold adaptation performed in response to these conditions, that are performed by the receiver. Actions taken by the sender are outside the scope of this invention.
>
> (see col. 6, lines 39-59)

> Techniques for monitoring three specific indicators of network conditions are defined herein. Each of these techniques may be used separately, or they may be used in combination. Using these techniques provides for self-calibration of the receiver threshold, without the need for a user to make threshold adjustments. This self-calibration is useful for dynamically detecting, and quickly responding to, unexpected conditions in the network. For example, the threshold may have been set incorrectly originally, based upon incorrect predictions about such things as network load, link speed, etc. Or, bandwidth may have been added after the threshold was originally set, so that the original setting was correct at the time but no longer is appropriate for the current capacity. The present invention also detects a sender that is just "ramping up", i.e. just beginning to send data, and allows the sender to come up to speed very quickly. This situation is detected by a first monitor that keeps track of the percentage of "increase" messages sent over a recent interval. This monitor also detects the presence or absence of congestion in the network, and adjusts the threshold in response. A higher threshold is used when the network is not congested, so that more increase messages will be sent to the sender, requesting the sender to increase its transmission rate. Conversely, the threshold is lowered when congestion is detected, so that the sender will decrease the transmission rate.
>
> (see col. 6, line 62 through col. 7, line 21)

As can be seen, Bird's receiver has a monitor that detects the presence or absence of congestion in the network and then adapts a threshold value and sends this threshold value to a sender which in turn increases its transmission rate of data traffic if the network is uncongested or the sender decreases its transmission rate of data traffic if the network is congested (see also abstract). In particular, Bird's sender either increases or decreases its transmission rate of the data traffic based on the receiver's adapted threshold value. Bird's sender does not "drop" data traffic nor does it make sense for Bird's receiver to request that the sender "drop" data traffic no matter how much congestion the network is currently experiencing. Thus, there is no hint where Bird teaches the "dropping of data traffic" let alone where Bird would provide the motivation to one skilled in the art to modify Jeffries's network node to include the claimed automatic threshold adaptation procedure which determines when the network node (not the sender or receiver) drops or marks one or more of the data units. The patentability of the claimed performing step is even more apparent in view of the newly cited claimed directing step wherein the sender or receiver of the queued data units introduce the flow control parameter that is then used by the network node to adjust the threshold value in the automatic threshold adaptation procedure to determine when to drop or mark one or more of the data units.

In the Final Office Action, the Examiner indicated that Jeffries and Bird did not teach the claimed directing step which specifically recites "determining, in a procedure, one or more of the one or more flow control parameters from a flow control parameter introduced by one of a sender and a receiver of the flow queued in the queue" (see pages 6-7 in the Final Office Action). In an attempt to correct Jeffries's and Bird's deficiencies, the Examiner cited Meyer and stated "Meyer et al. from the same or similar field of endeavor teach implementing fairness of the method, further comprising the step of determining, in a procedure, one or more of the one or more flow control parameters from a flow control parameter introduced by one of a sender and a receiver of the flow queued in the queue (paragraph [0021] lines 1-4)(see page 6-7 of the Final Office Action). The relevant sections of Meyer are as follows:

A method of controlling the flow of an amount of data from a sending peer to a receiving peer of a predetermined communication protocol is described. The method comprises dividing the amount of data into a plurality of data segments, where the data segments are ordered in a sequence. The segments are sent to the receiving peer in the order of said sequence. The receiving peer acknowledges the correct receipt of a data segment and identifies the last correctly received data segment of the sequence that was received in the proper order of the sequence. The sending peer is arranged such that if it receives a threshold number of duplicate acknowledgements, it performs a retransmission. The threshold number that trigger a retransmission is an adaptive parameter and may assume values larger than three.

(see abstract)

[0020] The adaptation of the threshold number to the general conditions can be done in any suitable or desirable way. For example, characteristics of the connection between the sending peer and receiving peer can be measured, and the threshold number can be adapted to such measured characteristics. Preferably such measurements are performed by the sending peer. The determination can be done with respect to one or more of any desirable, measurable characteristics of the connection, such as an amount of disturbance (e.g. in terms of error rate), average transmission time, delay, etc. As an example, it is possible to adapt the duplicate acknowledgement threshold to the transmission error rate in such a way that if the error rate increases, the duplicate acknowledgement threshold is lowered and vice versa. More specifically, starting from a predetermined initial threshold value determined for an initial error rate value, an increase of the error rate equal to a predetermined increment can lead to a corresponding lowering of the threshold by a predetermined increment. Naturally, the specific values will depend on the individual application and requirements.

[0021] According to a preferred embodiment, the duplicate acknowledgement threshold is adapted on the basis of a variable number of data segments belonging to a predetermined group related to the flow control.

Meyer deals with the behavior of an end-to-end transmission protocol (TCP) and does mention a "threshold number adaptation procedure" but this a procedure for determining a threshold number that indicates when a TCP sender should retransmit a data segment. Meyer does teach where the characteristics of a connection between a sending peer and a receiving peer are measured, and the threshold number can be adapted to such measured characteristics. However, as discussed above this threshold level indicates when a TCP sender should retransmit a data segment to the receiver and this has nothing to do with the present invention where the sender or receiver of the

queued data units introduce the flow control parameter that is then used by the network node to adjust the threshold value in the automatic threshold adaptation procedure to determine when to drop or mark one or more of the data units. Applicant submits that the reason for this particular difference may be in part because the claimed method relates to "queue management" whereas Meyer does not relate to "queue management" nor does Meyer even mention the term "queue".

In summary, Applicant submits that Bird does not correct Jeffries's deficiency with respect to the claimed performing step and that Meyer's does not correct Jeffries's and Bird's deficiencies with respect to the claimed directing step. In fact, Jeffries, Bird and Meyer do not have anything to do with the claimed invention which relates to a network node that uses one or more sender or receiver flow control parameters for adapting the threshold in an intermediate queue to determine when to drop or mark one or more of the data units. Hence, Applicant submits that the amended independent claim 33 and the corresponding dependent claims 34-35 and 37-52 are patentable over Jeffries, Bird, Meyers or any combination thereof.

Referring now to the amended independent claim 53, Applicant respectfully submits that this claim is patentable in view of Jeffries, Bird, Meyers or any combination thereof. The amended independent claim 53 recites the same or similar distinguishing limitations that have been discussed above with respect to the amended independent claim 33. As such, the aforementioned remarks regarding the patentability of the amended independent claim 33 apply as well to the amended independent claim 53. Accordingly, Applicant respectfully requests the allowance of the amended independent claim 53 and the corresponding dependent claims 54-55 and 57-64.

CONCLUSION

In view of the foregoing remarks, Applicant believes all of the claims currently pending in the application to be in a condition for allowance. Therefore, Applicant respectfully requests that the Examiner withdraw all objections and rejections and issue a Notice of Allowance for pending claims 33-35, 37-55, and 57-64.

The Commissioner is hereby authorized to charge any fees for this paper to Deposit Account No. 50-1379.

Applicant requests a telephonic interview if the Examiner has any questions or requires any additional information that would further or expedite the prosecution of the Application.

Respectfully submitted,

/William J. Tucker, Reg. No. 41356/

By William J. Tucker
Registration No. 41,356

Date: February 16, 2010

Ericsson Inc.
6300 Legacy Drive, M/S EVR 1-C-11
Plano, Texas 75024

(972) 583-2608 or (214) 324-7280
william.tucker@ericsson.com